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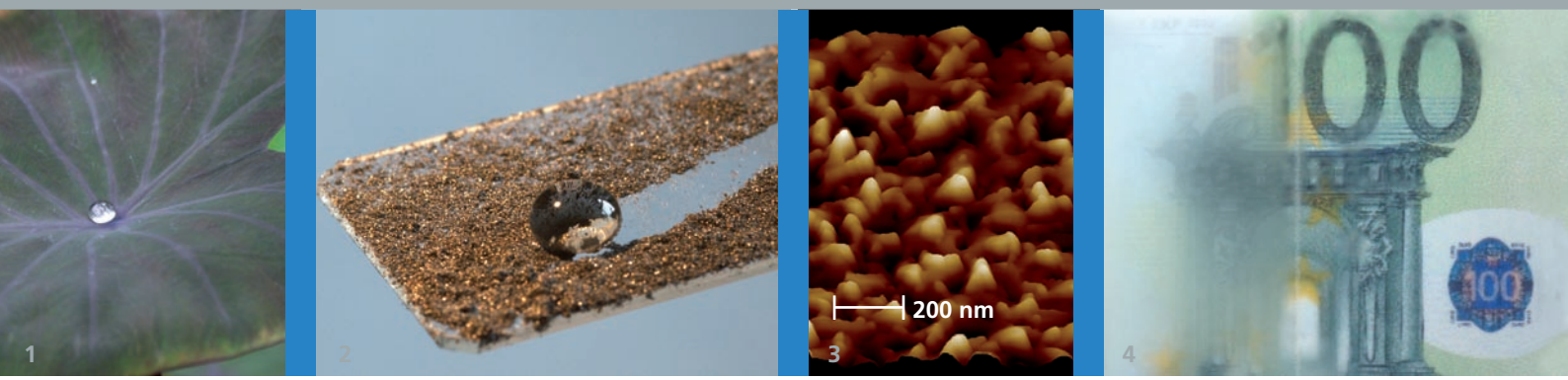

1 *Ultra-hydrophobic leaf of Taro plant.*
2 *Self cleaning effect on glass surface with ultra-hydrophobic coating.*
3 *Nanostructure of the sol-gel coating.*
4 *Fogging-test: bank note viewed through glass with (half-site) hydrophilic coating (left: uncoated, right: coated).*

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nanocoatings and additives ETC PRODUCTS

ULTRA-HYDROPHOBIC AND HYDROPHILIC / ANTI-FOG GLASS SURFACES

Motivation

Roughness structures in the micro- and nano-ranges play a key role for functional surfaces. Ultra-hydrophobic, hydrophilic, and anti-fog properties can be achieved by a variety of stochastic, but deliberately tailored roughness characteristics. This results in promising potentials for the fabrication of such structures. Moreover, it even allows for linking the functional properties with optical quality (e.g. for glass surfaces). At the same time, novel challenges arise for appropriate characterization methods as well as simulation and modelling techniques.

Solution

With the flexible modelling-, measurement- and analysis tools developed at Fraunhofer IOF we are capable of predicting, defining and controlling roughness structures for optimal hydrophobic and hydrophilic properties. The direct link of simulation, fabrication, and characterization constitutes a unique basis for efficiently triggering the entire process chain.

Implementation

Sol-gel coatings from ETC PRODUCTS GmbH with adjustable nano roughness enable the fabrication of both ultra-hydrophobic (advancing contact angle: 155°, hysteresis < 30°) and hydrophilic, anti-fog glass surfaces. At the same time, scattering losses are minimized.